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Farm and Home Science

AGRICULTURAL EXPERIMENT STATION
DIVISION OF AGRICULTURAL SCIENCES
UTAH STATE AGRICULTURAL COLLEGE

Vol. 16 No. 3

September 1955

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W. O. LEE and
F. L. TIMMONS

RESULTS of recent experiments show that chokecherry can be successfully controlled by repeated applications of 2, 4-D or 2, 4, 5-T esters during a period of 2 to 3 years. This will be good news to fruit growers in northern Utah whose peach and cherry orchards are menaced by chokecherry growing nearby.

Research by the Utah Station has shown that western chokecherry (*Prunus virginiana*) is an important carrier of western x-virus disease of stone fruits. This

These chokecherry trees were killed by two basal spray applications of 2,4,5-T at 8 percent in diesel oil made in April 1952 and June 1953. Untreated chokecherries are shown at right and in the background

Three repeated foliage spray applications of 2,4-D low volatile ester at 2000 ppm in water made during a 3-year period gave a complete kill of the chokecherries at the right. Some regrowth from the roots developed during the fourth season on the trees at the left which received 3 foliage applications of the same chemical at only 1000 ppm

This developing thicket of chokecherries constitutes a definite hazard, western x-virus infection, to the young peach orchard nearby. This is the ideal time to eradicate the chokecherries — while they are small and before they are infected with virus



You can now

Control Chokecherry

Growing Near Foothill Fruit Orchards

disease, commonly found in the orchards of the state, causes large financial losses to fruit growers each year. It reduces yields and lowers the quality of certain fruits, particularly peaches and sweet and sour cherries. It also kills some infected trees immediately and makes the removal of other diseased trees necessary.

Western x-virus disease of stone fruits is spread by the geminate leafhopper (*Colladonus geminatus*). When this insect feeds on an infected tree it picks up the western x-virus. Then as it moves about the orchard feeding it can transmit the virus to healthy trees. One of the present means of control is to remove all diseased trees from the orchards in a fruit growing section. However, in northern Utah many of the orchards are located along the foothill areas where diseased wild chokecherry trees are often found growing adjacent to or near the orchards. This chokecherry serves as a constant source of infection so that a control program within the orchards alone can never be too successful.

Research workers who are investigating the control of western x-virus disease believe that the eradication of western chokecherry from the vicinity of the orchards in northern Utah may be necessary if an effective control program is to be carried out. In Utah County,

The research reported in this article was conducted cooperatively by the Field Crops Research Branch, Agricultural Research Service, U. S. Department of Agriculture and the Utah Agricultural Experiment Station. Both MR. LEE and MR. TIMMONS are agronomists with the Field Crops Research Branch. Mr. Timmons has charge of the regional weed control research program. Both these men were formerly stationed at Logan, but were transferred last fall to the University of Wyoming at Laramie.

IN BRIEF

- Chokecherry, which grows rather abundantly in canyons and foothills of northern Utah, is an important carrier of the western x-virus disease of stone fruits. It therefore is a serious menace to peach and cherry orchards in the area.

- Experiments show that chokecherry can be killed by repeated foliage spray applications of low volatile esters of 2,4-D or mixtures of 2,4-D and 2,4,5-T at a concentration of 2000 parts per million (0.2 percent) by weight in water. Treatments made each year at the full leaf and blossom stage early in June can be expected to kill 90 percent of the trees in 2 years and eventually to give complete eradication. Foliage sprays with ammonium sulfamate or 2,4-D amine gave unsatisfactory results in the experiment.

- The experiments also showed that basal applications of a low volatile ester of 2,4,5-T at 2 percent acid equivalent by weight in diesel oil applied in early spring killed all trees after two treatments in two years. The treatments were applied to a zone at the base of the trees from the ground up 15 inches. Basal and overall spray applications of 2,4,5-T and brushkiller mixtures during dormancy in fall and winter were much less effective than early spring treatments and are not recommended.

- The foliage spray applications necessary to kill out chokecherry will cost \$15 to \$25 per acre of actual infestation for chemical and labor as compared to about \$40 per acre for spring basal treatments. However, the basal applications are better adapted for treating chokecherry on steep hill-sides, scattered among dense thickets of other brush, and in other rather inaccessible places. Also basal treatments involve less hazard to nearby sensitive crops from spray drift.

where the virus incidence is less than one percent, there are no chokecherries growing in the foothill canyons or on the foothills.

Control Studies

Chokecherry is often considered an undesirable woody plant in many areas of the United States and some definite information on its control with 2, 4-D and 2, 4, 5-T was available previous to beginning studies in Utah in 1951.

These studies were conducted in an orchard at the Farmington Field Station of the Utah Agricultural Experiment Station on 6-year-old chokecherry trees that had been planted in rows for studies on the transmission of virus diseases in stone fruits. Each plot contained 10 or more trees.

Chemical treatments were made with a small power sprayer equipped with a single nozzle, low

volume hand boom. Spraying pressures were maintained at 30 pounds per square inch.

Foliage Sprays

An experiment begun in 1951 compared 4 different chemicals applied early in June at the time the chokecherry reached the full leaf and blossoming stage. Treatments tested included 2, 4-D amine, the propylene glycol butyl ether ester of 2, 4-D, a brushkiller containing a 50-50 mixture of the propylene glycol butyl ether esters of 2, 4-D and 2, 4, 5-T and ammonium sulfamate. The two 2, 4-D formulations and the brushkiller were applied at concentrations of 1000 and 2000 parts per million (0.1 and 0.2 of 1 percent by weight in water) while the ammonium sulfamate was tested at rates of $\frac{1}{2}$ and 1 pound per gallon of water. All treatments were applied in suf-

Advantages and disadvantages of foliage and spring basal methods of application

	Foliage sprays		Spring basal applications	
	Advantages	Disadvantages	Advantages	Disadvantages
1. Cost of chemical	\$15 to \$25 per acre			\$40 per acre
2. Application	Works well where chokecherry patches are small or open enough to permit power sprayer to be moved close enough for spraying.	Difficult to use where scattered chokecherry present in large patches. Power sprayer can't go into brush. High volume of spray necessary. Creates problem on steep hillsides where vehicles can't be driven readily.	Knapsack sprayer can be used. Thus adapted to spraying scattered chokecherry in large brush patches. Low volume spray needed. Could be carried on steep hillsides if necessary.	Difficult to treat where underbrush is heavy around base of trees.
3. Hazards		Treatments must be made in June after sensitive crops planted. Spray must be shot high into the air to get complete foliage coverage. Creates a serious drift hazard.	Treatments can be made in April before sensitive crops planted. Spray directed at tree base. Little drift hazard.	

ficient water to insure uniformly thorough wetting of all foliage.

Results of this test are shown in table 1. As will be noted, none of these treatments gave entirely satisfactory control of chokecherry with the first application. Top kills ranged up to 97 percent but regrowth from the roots was abundant wherever top kills were heavy. Thus, total plant survival was relatively high, ranging from 38 to 100 percent. However, observations made in 1953 following one retreatment in 1952 showed that two of the chemicals had reduced the total plant growth surviving to 8 percent or less which for practical purposes is satisfactory. Some spot retreatments would be needed for 1 or 2 more years

to eradicate scattered sprouts from the roots. Complete elimination of chokecherry appeared possible with a total of 10 pounds or less of 2, 4-D or of brushkiller mixture acid equivalent per acre (2 to 3 gallons of a commercial formulation).

Herbicides to Use

It would appear from these results that either the 2, 4-D ester or the brushkiller mixture at 2000 parts per million can be used effectively as foliage applications for control of chokecherry. The brushkiller mixture seemed to give slightly better results from the initial application but after one retreatment there was little difference between the effectiveness

(Continued on page 61)

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Division of Agricultural Sciences
D. W. Thorne, Director
Agricultural Experiment Station
Carl Frischknecht, Director
Cooperative Extension Service

Gladys L. Harrison, Editor



Adequate moisture combined with high fertility produces a bumper crop on this dry farm in San Juan County as demonstrated by the county agent, Oris Rudd

Low dry land wheat yields are most often a result of inadequate precipitation

Moisture a limiting factor in

Fertilizer Returns from Winter Wheat

REX F. NIELSON and GORDON A. VAN EPPS

THE use of commercial fertilizer on dry land winter wheat may not be justified in many areas of Utah during years when rainfall is below normal. This conclusion was reached as a result of forty-one experiments conducted during the last three years (1952-54) in eight counties. These trials were made in areas where the annual precipitation is near the lower limit for producing dry land grain and during three years when the rainfall was below normal.

Previous work with commercial fertilizer, as reported in Utah Agricultural Experiment Station Bulletin 358, showed dry land wheat yields were materially increased with the addition of nitrogen fertilizer. The majority of the earlier trials, however, were made

in northern Utah during a period of above normal rainfall.

Tests on Sources and Amounts of Fertilizer

The tests reported in this article were carried out in cooperation with farmers in each of the various counties. Sites were selected on fields typical of the area. Treatments were made to measure the effect of rates, kinds, source, and time of application of commercial fertilizer. The majority of the plots were fertilized as early as possible in the spring. The fertilizer was broadcast on the surface of the soil. Three sources of nitrogen in equivalent amounts were used in the trials, ammonium sulfate, ammonium nitrate, and urea. Concentrated superphosphate was included in the 1954 tests. Nitrogen was applied at two levels, 20 and 40 pounds of available N per acre. Three experiments were conducted where fall versus spring application was measured. Samples were

harvested from all plots and yield data and protein content of the wheat were obtained.

Fertilizer Affects Protein Content More Than Yield

The data from these trials show that nitrogen fertilizer increased yields significantly in only 3 of the 41 experiments. The protein content of the wheat was increased significantly in 16 tests out of 40. At one location nitrogen fertilizer reduced the yield. Phosphate failed to influence yields in any of the 13 trials conducted in 1954. The data in table 1 show that in all the counties studied the influence of fertilizer was similar.

No conclusions can be drawn concerning the effects of source, rate, or time of application of nitrogen because of the limited number of trials where yields were significantly increased. There were indications, however, that no appreciable difference exists between sources of nitrogen and time of

REX F. NIELSON and GORDON A. VAN EPPS are assistant professors of agronomy. Mr. Nielson has charge of the fertilizer tests throughout the state. Mr. Van Epps has headquarters at Snow College at Ephraim.

application. The yields varied from a low of 6 bushels per acre to a high of 45 bushels. Protein content ranged from 8 to 17.5 percent.

Benefits Nullified by Insufficient Moisture

The effects of nitrogen were noted on many of the trials early in the spring soon after the fertilizer was applied. The dark green color on the treated plots in contrast to the light yellow-green on the untreated plots has clearly shown that most of the areas tested are deficient in nitrogen. The limiting factor as the season progresses changes from nitrogen to one of inadequate soil moisture. The early benefits from the nitrogen are nullified because insufficient soil moisture is available to carry the crop through the remainder of the season. In some cases the additional vegetative growth stimulated by added nitrogen becomes a handicap to the plant during periods of drought. In such cases yields may be depressed. This lack of adequate moisture in late May and June has largely been responsible for the failure of nitrogen to increase yields in the trials reported here.

Timeliness of Storms Important

Other investigators working with winter wheat have observed that yields are influenced more by the timeliness of storms than by total precipitation. The time of storms influences considerably the effect of commercial fertilizer on grain yields.

A number of factors should be taken into consideration before deciding whether it will be profitable to use nitrogen fertilizers in the areas studied in this report. Good stands of grain are essential. If fall emergence is poor or the grain suffers from winter injury, it is doubtful if the addition of fertilizer will be profitable. The moisture conditions and outlook for the year should be taken into consideration. Will a bonus be paid for high protein wheat? During some years the increased pro-

Table 1. The location and number of field experiments showing whether or not yield or protein content was significantly increased through use of commercial fertilizer*

Location	No. of tests	Year			Significant increase	No increase	Significant depression
		1952	1953	1954			
yield							
Juab	8	00	000	000	0	8	0
Millard	9	000	000	+00	1	8	0
Rich	3	0	00	.....	0	3	0
San Juan	7	00	+0	000	1	6	0
Salt Lake	3	.....	.....	000	0	3	0
Sanpete	7	.....	+00—	000	1	5	1
Tooele	4	00	0	0	0	4	0
Totals	41	10	15	16	3	37	1
percent protein							
Juab	8	++	++	000	4	4	0
Millard	9	+++	+00	+00	5	4	0
Rich	2	0	0	.....	0	2	0
San Juan	7	00	+0	++0	3	4	0
Salt Lake	3	.....	.....	+00	1	2	0
Sanpete	7	.....	++00	000	2	5	0
Tooele	4	00	0	+	1	3	0
Totals	40	10	14	16	16	24	0

*Significant increase +
No increase 0

Significant decrease —

The number of plus, minus, and zero signs in each of the year columns shows the number of tests conducted that year.

tein content will more than pay the cost of the fertilizer and the chance of raising the protein content is much greater than increasing yields. Added nitrogen may also be used to decompose excessive stubble residue and help alleviate nitrogen deficiencies in the current season crop.

If all the factors mentioned previously are favorable, then the odds of getting a financial return from applying fertilizer are greatly increased. Were it possible to predict the frequency and amounts of precipitation for each season, much of the risk of applying fertilizer would be eliminated.

NEW PUBLICATIONS

Bul. 376. Potato production, Utah, 1953, an economic analysis, by E. M. Morrison and W. G. Kearl. Department of Agricultural Economics. 26 p.

This bulletin points out the factors in profitable potato production in Utah. Economical use of labor, high yields, and large enterprises were all found important in profitable production.

Bul. 377. Performance testing studies with beef cattle, by J. A. Bennett and D. J. Matthews. Department of Animal Husbandry.

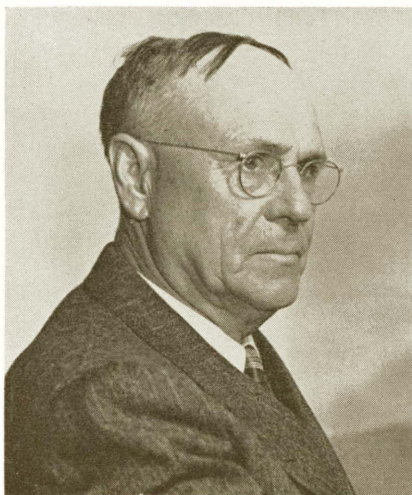
This is a technical report of performance tests with 124 beef calves. Sires and sex were found to be highly significant in determining rate of gain and final feedlot weight. Initial weight of calf at start of feeding test did not significantly influence rate of gain, but it had a highly significant influence upon efficiency of gain and final feedlot weight.

Copies of these publications will be sent on request to the Utah Agricultural Experiment Station, Logan, Utah.

Two Staff Members Retire with 66 Years of Service to the College and State

DAVID STOUT
JENNINGS

Retires as professor of
soils



JOSEPH ARCH
GEDDES

Former head of the De-
partment of Sociology



David Stout Jennings

DR. DAVID STOUT JENNINGS, emeritus professor of agronomy, has reached another milestone in a long and serviceable professional career as soil scientist. After nearly 50 years' association with the Utah State Agricultural College as a student and teacher, Dr. Jennings has retired.

Dr. Jennings was born January 1, 1885, in Rockville, Utah. He attended district school in a one-room ungraded school in Rockville, and in 1903 took preparatory high school work at the Branch Normal in Cedar City. In 1905 and 1906, he attended Brigham Young University, and in 1907 he entered the Utah State Agricultural College, graduating in 1912. In the fall of that year he entered Cornell University where he had been granted a teaching instructorship in soil technology. He was awarded the Ph. D. degree in 1917.

After the completion of his advanced studies, he returned to Utah as a county agent in Utah County. After only one year he was employed by the Agricultural Experiment Station to be in charge of soil survey. Since that time, most of the arable acres of land in the state have been surveyed under his supervision. He has not only been a pioneer and leader in survey work, but has contributed as a teacher of soil genesis, classification, and survey.

His primary research has been largely in the field of physical chemistry of soils. However, he has also aided in the development of a soil sampling machine, and developed a new method of mechanical analysis for the study of the physical properties of soils. Much of his research work has been in cooperation with the Physics, Irrigation and Drainage, and Agricultural Economics Departments on drainage and other problems of irrigated lands.

During his long and fruitful career, Dr. Jennings has published many technical articles in addition to the numerous soil survey reports. He is currently developing a soil key and map of Utah based on climatological data from the weather stations of the state.

Recently, Dr. Jennings was selected by the Hydrotechnic Corporation of New York City to conduct a soils investigation in an agricultural development program of two large river valleys in Angola, Africa. He spent a short time on this project with headquarters at Luanda. Mrs. Jennings accompanied him on this trip to Africa.

Retirement does not mean that a career is closed. Dr. Jennings will continue as emeritus professor. He will come and go as he pleases,

(Continued on page 60)

More Adequate Public Libraries in Utah

Await Aroused Public Interest... Legislative Action...
Consolidation of Small Units

UTAH libraries like Utah schools have traditionally occupied a favorable though static place in the affections of the people. This has manifested itself through a comparatively widespread effort to

DR. JOSEPH A. GEDDES, now emeritus professor of sociology, has just completed a study of Utah libraries which will be published by the Utah Station in bulletin form. In this article he discusses some suggestions for improving the libraries of the state.

JOSEPH A. GEDDES

establish libraries in the larger and in some of the smaller communities, and later on in facing up to the difficulties, particularly in the smaller communities, of maintaining them. Once started, only a few have been closed down. Forty-nine libraries reported to the State Department of Public Instruction in 1953. Of these, three were large city libraries with branch libraries and eleven were county libraries which operated some 20 branches or combination of branch and school libraries. In one county library, two bookmobiles make nu-

The half of this building on the left was formerly a town library. It was open three hours each Saturday. It contained few books and was little used. The librarian was a retired school teacher. The library is now closed

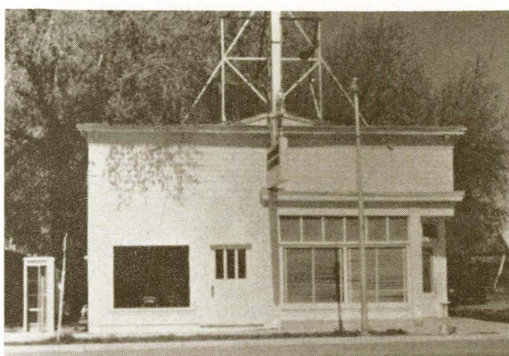
A typical Carnegie library. Outside of Salt Lake and Davis Counties where integrated systems prevail about half of Utah's libraries were gifts from Andrew Carnegie. They are supported by a single community. The present need is for integration into systems. Architectural planning of library buildings has changed greatly since these buildings were designed

merous regularly designated stops. In this county, the county library deposits books in fifty-two schools under a cooperative arrangement with them.

The range in effective library service and library maintenance between Utah's finer and poorer libraries is much wider than in many states and is far too wide for a people who believe in long range social planning and who are sufficiently interested in sound institution building to practice culture analysis and appraisal.

To locate areas where lag in library growth has become pronounced, does not represent serious difficulty; to clarify why these areas are content with retarded growth is more difficult; to present sound plans for library improvement for the benefit of all citizens requires extensive acquaintance with progressive thought within the area and in other areas.

This is the headquarters of Utah's finest library system, the Salt Lake County Library at Midvale. Although low in trained personnel it is well directed and has most of the characteristics of superior library services—large book stacks, numerous outlets, adequate transportation facilities, large variety of library services, and a modern building program



Weaknesses in the Library System

The chief areas of weakness in Utah's library system are:

There is no organization at the state level. No stated authority has been set up by law to activate a library system, to unify its parts, to provide financial support, or to integrate its activities, administratively or otherwise.

Utah libraries are either municipal or county, neither of which, for the great majority of libraries, constitutes a sound or adequate base for library units. The base is too small.

A large proportion of Utah's libraries are not only small but independent. They neither work together nor serve enough people or do they have enough revenue to provide more than a lean framework of library services. Nor do conditions and trends indicate that as institutions, more of them have or will have the power to grow appreciably.

Administrative integration of small units is lacking. Small units properly integrated into a system find in cooperative movement of books and facilities, the vitality they lack in isolated operation.

No state plan exists for equalization of gigantic inequalities between wealthy and economically

(Continued on page 62)

To provide adequate library service for all the people of Utah irrespective of age or reading ability, and thus to get in step with progressive states in the public library field, Utah must:

- Abandon the municipal concept of small independent public libraries in favor of library systems composed of a considerable number of small cooperating units.
- Unify the independent units into systems under a single administrative unit in order to bring books and services into relation with need where it exists.
- Organize a strong state department or a subdivision of an existing state department to integrate the various systems and to aid in developing sufficient resources to supply the needs of all of the people.
- Make provision for state aid as a means of equalizing large inequalities in taxable wealth among the library systems.
- Grant authority for the erection of standards of services, particularly at the state and regional levels looking to well trained personnel in all directive areas in the system.
- Improve salaries of librarians so that increasingly competent young people will enter this field as a life career.



Interior of the bookmobile at left. Bought at a cost of about \$12,000 the bookmobile has a capacity of about 2,000 volumes. With its regular stops, the bookmobile helps to shorten the distance between users and the library



This is one of Utah's two bookmobiles. Both are owned by Salt Lake County Library. With the development of regional library systems the bookmobile and other modern services should be available throughout the state



Illustrating the increasing community and social uses of the modern library, this group is spending a week in this air conditioned, indirectly lighted room of the Library of Congress

How Ripe Should We Pick Peaches?

Most consumers prefer their peaches riper than those presently arriving on midwest markets and are willing to pay premium prices for them

PEACHES from Utah are arriving in the terminal markets too green for consumption. That was the conclusion reached by economists of the Utah and Colorado Experiment Stations and the U. S. Department of Agriculture who have studied the problem. In some cases the peaches will ripen if held in the wholesale market, in the retail store, or in the consumer's basement. In other cases peaches are picked at such an immature stage that the ripening process is never completed properly and the peaches retain or develop a bitter taste and undergo a great amount of shrinkage. In any case if the peaches had been allowed to ripen properly before picking greater size would have been attained. This would result in a greater yield of peaches and a better price because of the increased size and the better quality.

Peaches Harvested When Too Green

Peaches for out-of-state shipment should not be picked ripe, for they

DR. ELLIS W. LAMBORN, associate professor of agricultural economics, returned to USAC a year ago after four years in industrial research and as head of the Department of Economics of Alma College in Michigan.

Peaches delivered to the packing shed of George Anderson of Brigham City are dumped on the machine to be sized and have the fuzz removed

Girls pick out peaches that will not meet grade

ELLIS W. LAMBORN

will not stand shipment, but on the other hand they should not be picked at such a maturity that they are still hard or firm when

Table 1. Proportion of peaches of specified maturity sorted at selected retail stores in four midwestern cities, 1949

Maturity at the retail store	Proportion of the peaches that were of specified maturity	
	First half of season	Second half of season
	percent	percent
Hard	5	2
Firm	23	10
Firm-ripe	35	30
Ripe	27	45
Soft	4	5
Bruised	5	7
Other	1	1

they reach the retail store in Kansas City or some other midwestern market.

Research has indicated that peaches in transit from Utah to most markets (this takes about four days) will advance about one stage in maturity. If a peach is picked at the hard stage in some orchard in Utah and is handled in the normal manner the peach will in most cases be of firm maturity when it arrives at the retail store in Kansas City. A firm peach is considered by most consumers to be inedible. A peach picked at the firm stage will arrive at the Kansas City store in a firm-ripe condition. A firm-ripe peach is edible but still not of the best quality for eating. Peaches picked at the firm-ripe stage will be mostly of ripe maturity upon arrival at the midwestern retail store. These

Table 2. Proportions of peaches at three stages of maturity sold at specified price differentials in selected stores, 1949*

Price differential per pound	Total quantity sold	Proportion sold of each maturity		
		Firm	Firm-ripe	Ripe
<i>cents</i>	<i>pounds</i>	<i>percent</i>		
1	3661	10	32	58
2	787	5	24	71
3	1943	8	29	63

*Includes stores in Kansas City, Oklahoma City, Minneapolis, and Milwaukee.

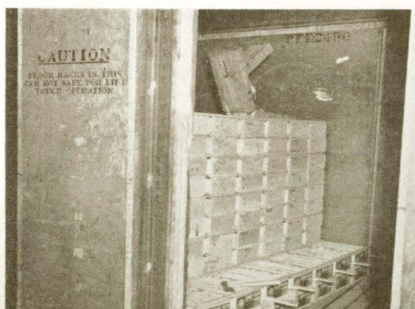




ripe peaches are most preferred by consumers.

During 1949 Utah and Colorado peaches were sorted by maturity at selected retail stores in four midwestern markets and offered for sale. Peaches sorted during the second half of the season were in general of a more advanced stage of maturity than were the peaches sorted during the first half of the season. In the second half 42 percent of the peaches sorted in the retail store were still of hard, firm, or firm-ripe maturity (table 1). These peaches were still not ripe enough to be most desired by con-

(Continued on page 62)

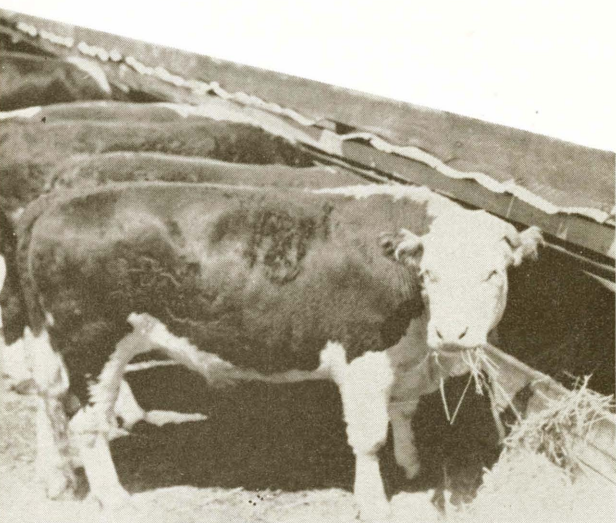


Upper left—The fruit is sized by machine in preparation for packaging

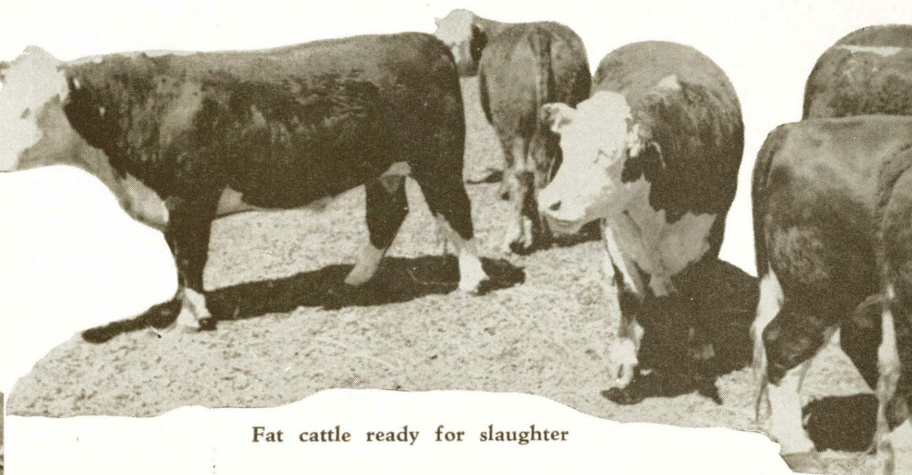
Lower left—The peaches are individually wrapped and packaged into 16 pound boxes

Right, from top to bottom—The packaged boxes are moved by belt to a central location where the lids are nailed on. An official state inspector makes sure that the fruit meets grade specifications. The peaches are then loaded into a refrigerator car ready for shipment.

FOR SEPTEMBER 1955



Feeder cattle of the type commonly fed



Fat cattle ready for slaughter

LYNN H. DAVIS

Spread between buying and selling price, size of enterprise, and efficient feeding practices determine . . .

Profits from Feeder Cattle

FINANCIAL success in cattle fattening is determined largely by the cattle feeders' ability to buy and sell and his ability as a feeder. Ability to read the economic signs along with the "master's eye" to fatten animals efficiently is a profitable combination. These are conclusions from a study of 103 cattle fattening enterprises in Utah. The enterprises consisted of steers or heifers and made an average net return of \$20 per head above all costs. The approximate range in net return was from \$30 per head to \$50 per head. The enterprises averaged 57 head fed for 133 days.

Cattle feeding is important to Utah's economy. About 50,000 head of cattle have been in feedlots on January 1st of each year

LYNN H. DAVIS, assistant professor of agricultural economics, is in charge of the research in the marketing of livestock. This is a regional project in co-operation with the other western states.

in recent years. Cattle on feed have increased about a third since 1940, probably because of high profits and rising prices.

The fattening enterprise is primarily a late autumn and winter operation. It creates a market for feed and employs labor that may otherwise be idle at these seasons. For these and other reasons cattle fattening enterprises are located in irrigated valleys throughout northern and central Utah where supplies of hay and grain are available. Beef cattle compete with other livestock for available feed supplies. The quantity of feed available limits the size of the industry in Utah.

In the enterprises studied, about three fourths of the cattle fattened were purchased in the fall — most were purchased in October — and either placed directly in feedlots or pastured temporarily in fields. In reply to a question, cattle feed-

ers reported most often that their cattle numbers were influenced by

- availability of home grown feeds
- number of cattle available from the operator's own breeding herd
- availability of labor which is used seasonally for other farm enterprises
- profit expectations

Cattle feeders in Utah sell about half of their fat cattle directly to packer buyers; auctions handle about a fourth, and terminal markets handle less than a fifth of the fat cattle.

Fat cattle from Utah feedlots are sold primarily during the winter and early spring (fig. 1). That is the time of year when marketings of grain fattened cattle are relatively large throughout the country and prices are seasonally depressed.

Cost of Fattening

Costs for each enterprise were collected by interviewing the cattle feeder. Cost of feeder cattle was the largest single cost. For most cattle feeders this represented a cash outlay either of his own or borrowed capital. Feeder cattle included in this study averaged 634 pounds when started on fattening rations and cost \$98 per head or 56 percent of total costs (table 1). Other costs arrayed from largest to smallest were feed 33.0 percent, labor 4.5 percent, overhead 4.0 percent, material 1.7 percent, and power 1.1 percent.

Average total feed cost per head for the study was \$58.33 (table 2). Feed amounts charged to the enterprise included all feed offered to the animals. Feed wastage was not measured. Grain accounted for 50 percent of feed cost. Barley accounted for 86 percent and wheat 10 percent of the grain consumption.

About a fifth of the total feed cost was for hay. Alfalfa hay accounted for 98 percent of the hay fed. Grass hay made up the balance. Some feeders allowed the animals grass hay free choice to insure that sufficient roughage was available in the ration.

Silage, mostly corn silage, was commonly fed in fattening rations.

Cattle feeding sheds and mangers such as these are adequate and well constructed

Cattle of mixed breeding frequently are as profitable as purebred cattle. Marketing becomes somewhat more of a problem, however

Fifteen percent of total feed cost was for silage. Only four feeders fed alfalfa silage.

Labor costs including operator and family labor were \$8 per head or 4.5 percent of total cost. Only 5 percent of the labor was hired. In most instances the cattle fattening was cared for by the operator with some additional family labor. An average of 6.2 hours per head was required to feed the cattle and an additional hour was

spent in bedding, moving, buying, and selling the cattle.

Overhead costs include charges to the enterprise for depreciation, repairs, taxes, and interest on money invested or used to finance the fattening operations.

Interest on operating capital, the largest overhead cost, was charged at 6 percent and amounted to \$3.91 per head fattened. Operating capital averaged \$9,234 per enterprise or \$160 per head. The

Cattle being fattened need a place to lie down



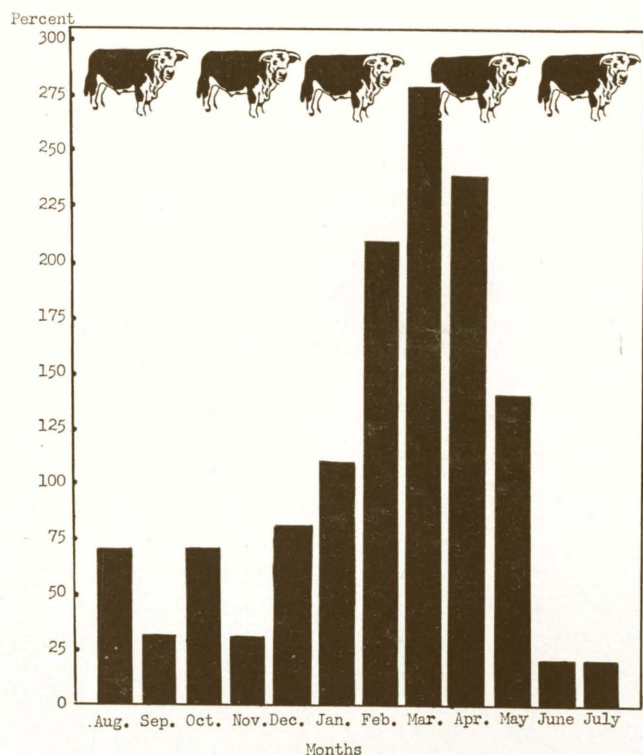


Fig. 1. Number of fat cattle sold each month in percentage of monthly average

value of cattle accounted for more than half of total capital. Feed accounted for about one third.

Depreciation was calculated for all buildings and equipment except trucks, tractors, and automobiles at standard rates as suggested by the Bureau of Internal Revenue. Trucks, tractors, and auto costs were charged by the mile or hour of use with depreciation and interest charges included in the rate allowed. If buildings or equipment were used for more than one lot

of cattle or for other purposes the depreciation cost was allocated to the various lots or uses on a percentage basis.

Interest on capital invested in fixed assets of land, building, and

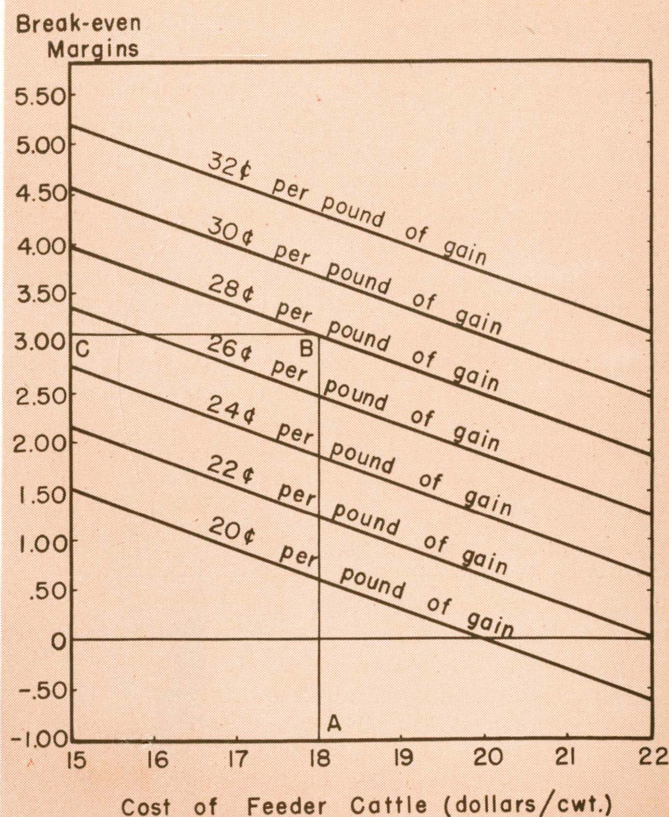


Fig. 2. Break even margins for fattening cattle at varying prices for feeder cattle and varying costs of gain, Utah, 1953-54

By locating the point on the sloping line equal to the cost of gain directly above the price of feeder cattle and following across to the break-even margin scale you can determine the necessary price spread based on the Utah study conducted in 1954. For example, assume feeder cattle are \$18 (point A) per hundredweight and gain costs \$.28 per pound (point B). The break-even margin is approximately \$3.10 (point C)

Table 1. Average cost of fattening beef cattle, selected areas of Utah, 1953-54

Cost group	Cost per lot	Cost per head marketed	Percent of total cost per head marketed
	dollars	dollars	percent
Cattle	5,715	98	55.7
Feed	3,417	58	33.0
Labor	456	8	4.5
Overhead	409	7	4.0
Material	169	3	1.7
Power	116	2	1.1
Total	10,282	176	100.0

Average number on feed per lot was 57.4 head
Average length of feeding period was 133 days

equipment was charged at the rate of 5 percent. Interest on fixed capital was allocated to various uses when assets were used for more than one purpose.

Taxes were charged on land and cattle. The amount of tax was computed for each lot on the basis of the assessed value and the county mill rate where the cattle were fattened.

Repairs to sheds, feed mangers, and other equipment were charged as an overhead cost to the enterprise.

Material costs include bedding, veterinary services, medicine, water, hotel and telephone expense to procure or sell the cattle, and miscellaneous expenses. Straw used to bed the cattle was valued by the feeder at the price that he could sell the straw. The amount

Table 2. Average total amount and cost of feed required to fatten beef cattle, 133 day feeding period, Utah, 1953-54

Item	Unit	Price per unit	Per head		Percent of total feed cost
			Amount	Total cost	
<i>Feed</i>		<i>dollars</i>	<i>dollars</i>	<i>dollars</i>	<i>percent</i>
Hay*	ton	18.00	.59	10.97	18.8
Grain	cwt	2.95	9.79	28.88	49.5
Dry beet pulp	cwt.	2.44	.48	1.17	2.0
Silage†	ton	9.82	.99	9.72	16.7
Wet beet pulp	ton	3.66	.67	2.45	4.2
Cottonseed	cwt.	3.92	.46	1.80	3.1
Syrup	cwt.	1.76	.70	1.23	2.1
Other				2.11	3.6
Total				58.33	100.0

*Hay includes both alfalfa and grass hay.

†Silage includes both alfalfa and corn silage.

Table 3. Receipts and net return from fattening beef cattle in selected areas of Utah, 1953-54

Item	Per lot	Per head	Per 100 pound gain
<i>Receipts:</i>	<i>dollars</i>	<i>dollars</i>	<i>dollars</i>
Cattle sold & used at home	10,826.08	188.71	67.16
Manure credits	433.52	7.56	2.69
Hides	.56	.01	*
Total receipts	11,260.16	196.28	69.85
Total Costs	10,096.09	176.00	62.63
Net return	1,164.07	20.28	7.22

*Less than \$.01.

of bedding used varied with the season of the year and the kind of feedlot and equipment used. Bedding was commonly used except during the summer, although some feeders fed in open sandy fields and no bedding was used.

Veterinary services and medicine average \$15 per enterprise.

Water costs were estimated on the basis of proportion of water used by the cattle.

The use of automobiles, trucks, tractors, and horses in buying cattle, hauling feed, livestock, or marketing cattle was charged at custom rates to the enterprise as power cost. Power costs average about \$116 per enterprise.

Receipt and Net Return

Receipts to the enterprise include all cash and non-cash items of income to the enterprise. Included

in receipts were the value of animals sold or used at home, the value of the manure produced, and the value of hides from dead animals.

The value of livestock sold is a composite value of the feeder cattle, the value of the added weight or gain put on during the fattening operation, and usually some value resulting from price spread. The latter may come from increased quality of the meat, seasonal variation of prices, or other factors which affect cattle prices.

Receipts averaged \$188.71 per head from fat cattle (table 3). This represents the value of 913 pounds liveweight at \$20.66 per hundred-weight, plus credits for manure and hides. The value of the gain in weight was \$58 and the increased value from price spread was about \$32.

Net return, which was calculated by subtracting total costs from total receipts, averaged \$20.28 per head or \$7.22 per 100 pounds of gain. Since labor and interest were charged as costs to the enterprise, feedlot operators who owned labor and capital used in the enterprise had earnings from these sources also.

Factors Related to Success

• Net return was related directly to size of enterprise. As the number of cattle fattened increased net return per head increased also. The increase in net return can be partly accounted for by changes that occur in costs. Overhead, labor, and material costs tended to decrease as size increased. Larger enterprises were associated with more efficient use of labor and capital than smaller ones. Investment in equipment was \$23 per head for small enterprises but only \$13 for the large enterprises. Price spread was not related to size of enterprise.

• Net return was related to gain per day. Net return per 100 pounds of gain averaged \$1.86 when gain averaged 1.1 pounds per day and was \$9.55 when gain averaged 2.9 pounds per day. Costs and total digestible nutrients were less per 100 pounds of gain for the classes making faster gains. Price spread tended to be greater for classes that made faster gains thus accentuating the increase in net return. Lots making larger gains per day were smaller and were fed for shorter periods. Even though they were on feed for less time gain per head was greater for faster gaining cattle.

• Price spread has a direct influence on net return to the enterprise. Price spread refers to the difference between purchase price and selling price of cattle fattened. Fifteen enterprises with lowest price spreads had an average spread of \$.07 and a net return per head of—\$.29 as compared to 22 enterprises with an average price spread of \$7.09 and an average net return of \$31.15 per head.

Generally it costs more to produce a pound of gain than the value of the gain. When a feedlot operator makes a net return from his operation it is because he sold fat cattle for more per pound than he paid for feeder cattle. He sold the original weight of the feeder for a fat cattle price. This price differential not only covers the deficit from adding gain but leaves a total differential for profit. The amount necessary to break-even is often referred to as the "necessary margin" or "break-even margin." The break-even margin for enterprises studied was about \$4 per hundred pounds.

Before purchasing feeder cattle, feeders must decide whether or not they think it will be profitable to feed cattle. Before making this decision, the feedlot operator should inventory his feed supplies and estimate total costs per pound of

gain. Feeder cattle prices can be obtained from market reports or by visiting an auction or central market. By using this information and the accompanying graph the break-even margin can be determined and the cattle feeder can decide based on the profit he thinks possible (fig. 2).

Break-even margins vary with cost of gain and with the price of feeder cattle. The ratio of cost of gain to cost of cattle determines the break-even margin. If the cost per hundredweight of gain and price of cattle are equal the break-even margin is zero. If the price of cattle exceeds the cost of gain the selling price of fat cattle may be lower than the purchase price of feeder cattle and the enterprise not suffer a loss. On the other hand, when gain costs are high relative to price of cattle a wide plus margin is required to break even.

a fine sensitivity to the authority and the validity of the language of facts. To him truth tells its story simply and well.

As a means of releasing Intermountain culture from excessive regimentation Dr. Geddes has examined selected areas of culture lag and has classified means of removing the bottlenecks which are clogging and slowing down forward movement.

Dr. Geddes has done much towards bringing institutional building into the daily life of people. Institutions are not only inherited, they are modifiable and are part of a building process which should be related to trends and movements. Social goals become vital only when incorporated into social programs. Acceleration takes place when the distance between programs and goals is shortened. People can altar community environments but they must do it themselves. As a means of measuring improvements in social patterns as programs are made vital Dr. Geddes and his associates have developed and shortened scales of measurement in two areas—libraries and cooperatives.

Terms which come to the minds of those who know Dr. Geddes well are such as these: creative, courageous, determined, painstaking, kindly, generous, an enemy of conformity—of acceptance without questions—of living in the past.

He was invited to give the Faculty Research Lecture in 1949. He holds a Utah Academy of Science, Arts, and Letters Award for conspicuous achievement in the social sciences. He has served on the board of directors of many cooperatives and had much to do with the founding of the Utah Cooperative Association. He has served as president of the Utah Conference of Social Work and has been a member and chairman of the State Self-Help Board. In 1933 he initiated the organization of the Cache County Mental Hygiene Society.

—Carmen D. Fredrickson

STAFF MEMBERS RETIRE

(Continued from page 51)

but his counsel and guidance will continue. He will now have more time to spend with Mrs. Jennings, their four children, and ten grandchildren. It will also allow him more time to manage his personal enterprises and to pursue his hobby — tillage of the soil and the growing of plants.

—Howard B. Peterson

Joseph A. Geddes

THE academic teaching service of Professor Joseph A. Geddes covers forty-two years and has included: eight years at the Oneida Academy, five of which he was principal; one year at Branch Agricultural College; four years at Brigham Young College, during one of which he was director of the Division of Arts and Sciences; twenty-nine years at Utah State Agricultural College, twenty-two of which he was head of the Department of Sociology and twelve as director of the Graduate Division of Social Work.

As a teacher Dr. Geddes has

kindled the desire for knowledge among many young people. Many able students have been attracted to the department and have found stimulation and growth there. Of thirty-two students who received M. S. degrees under his advisanship, twenty-four have continued on in pursuit of more advanced degrees. A number now have positions of national importance.

In the year of Dr. Geddes' retirement as chairman of the Sociology Department fifty students took degrees as majors in sociology, five of whom were given M. S. degrees or had completed one year of graduate work.

The chief academic interests of Dr. Geddes have been in the area of social organization and of community building. Continuous research on a part-time basis for the Experiment Station has enabled him to penetrate deeply into several areas of Intermountain culture where he has trod the path of the pioneer. In his writings and in his teachings Dr. Geddes has exhibited

CONTROL CHOKECHERRY

(Continued from page 48)

of the two formulations. Thus it is suggested that the price of the two materials be used to determine which one to buy. At the present time the brushkiller mixture costs almost twice as much as the 2, 4-D ester tested. 2, 4-D amine and ammonium sulfamate were much less effective than either the 2, 4-D ester or the brushkiller mixture and thus should not be used for control of chokecherry.

Both the 2, 4-D ester and the brushkiller mixture used in this test were low volatile esters. Only low volatile esters should be used and extreme care should be used in making applications to prevent damage by spray drift to tomatoes, cantaloupes, melons, or other sensitive crops which are often grown along the foothill areas. Observe all precaution usually recommended for using 2, 4-D. Choose a quiet day for making treatments and if there is any air movement make certain that it is blowing away from sensitive crops rather than towards them.

Spring Basal Applications

A second experiment was started April 25, 1952, in which basal spray applications were made on a series of chokecherry plots at the early leafing stage. The chokecherry trees were just beginning to leaf out. 2, 4-5-T (propylene glycol butyl ether ester) and a brushkiller (50-50 mixture of the propylene glycol butyl ether esters) were compared at concentrations of 2 and 8 percent by weight applied in diesel oil. The basal 15 inches of each tree was treated so that all bark in the treated area was wet to the point of run-off. The total volume applied ranged from about 30 to 50 gallons per acre for the first treatment.

Data presented in table 2 show that during the first year after treatment, little injury to the foliage appeared. All trees leafed out in 1952 and 1953 and showed only slight to moderate injury symptoms. However, sprouts $\frac{3}{4}$ -

Table 1. Results of foliage applications of chemicals on chokecherry

Chemical and concentration in water (acid equivalent)	Total gallons of spray per acre 1951-1953	Total pounds of acid per acre 1951-1953	Percent survival of top growth 6-13-52	Percent regrowth from tops and roots		
				6-13-52:6-1-53:7-1-54		
Original treatments made June 5, 1951. Retreatments made June 20, 1952, June 6, 1953, and June 18, 1954.						
*Amine salt of 2,4-D 1000 ppm	387	3.2	85	100	....	....
Amine salt of 2,4-D 2000 ppm	764	12.7	55	93	33	40
2,4-D ester* 1000 ppm	697	5.8	50	85	25	55
2,4-D ester* 2000 ppm	613	10.2	15	65	8	3
Brushkiller† 1000 ppm	581	4.9	40	85	23	48
Brushkiller† 2000 ppm	431	7.2	3	38	1	5
‡Ammonium sulfamate ½ pound per gallon	403	202	83	95	....	....
‡Ammonium sulfamate 1 pound per gallon	490	490	70	93	....	....
Untreated check			100	100	100	100

*Propylene glycol butyl ether ester of 2,4-D.

†50-50 mixture propylene glycol butyl ether esters of 2,4-D and 2,4,5-T.

†Treatments discontinued after 1951. These chemicals were not effective at these rates.

Table 2. Results of early spring basal applications of 2,4,5-T and a mixture of 2,4,5-T and 2,4-D on chokecherry

Chemical and concentration by weight applied in diesel oil (acid equivalent)	Gallons of spray per acre 1952-1953	Pounds of acid per acre 1952-1953	Percent top kill		Percent regrowth	
			6-13-52	10-6-53	6-1-53	7-1-54
<i>Original treatments made April 25, 1952. Retreatments made June 3, 1953.</i>						
*Brushkiller—2 percent	66	11.1	8	50	83	33
Brushkiller—8 percent	106	48.4	30	100	55	0
‡2,4,5-T—2 percent	70	11.8	10	97	95	Trace‡
2,4,5-T—8 percent	75	50.2	15	100	70	0

*Brushkiller—(50-50 mixture of the propylene glycol butyl ether esters of 2,4-D and 2,4,5-T).

†2,4,5-T—propylene glycol butyl ether ester.

†Trace—less than 1 percent.

inch in diameter and less were dead and there was considerable splitting of the bark and exudation of sap on the treated areas of larger trees. Retreatments were made June 3, 1953, using the same treatments as were used originally.

About 1 month after the June retreatments, the trees began to die and by October 6, plant kills

ranged from 55 to 100 percent. None of the plots showed regrowth in 1954 except those receiving the treatments with the 50-50 brushkiller mixture at 2 percent.

Results of this experiment would indicate that for basal applications 2, 4, 5-T should be applied at 2 or 3 percent acid equivalent by weight in diesel oil. Sufficient

spray material should be used to wet all bark and sprouts in the treated area. Even though 2, 4, 5-T and the brushkiller mixture applied at 8 percent gave slightly better results than 2, 4, 5-T at 2 percent, the difference was not great enough to justify the additional cost of application.

Basal Dormant and Overall Dormant Applications

In addition to the studies already discussed, experiments were conducted in which both dormant basal and dormant overall applications were tested. Treatments were made in November and December 1952 with retreatments in the fall of 1953. Observations made in the spring of 1953 and again in the spring of 1954 showed excellent top kills on most plots

receiving the dormant applications but regrowth from the roots was heavy. Thus, the dormant applications were inferior to either foliage or spring basal applications and no recommendations are being made for their use.

Foliage Versus Spring Basal Applications

Both foliage and spring basal applications have given satisfactory control of chokecherry in the Utah studies. The question might arise as to which method of control should be used. Both the basal and foliage treatments have definite advantages and disadvantages and these should be considered to determine which method is best adapted to fill the individual needs of the farmer. Some of the factors which should be considered are given in tabular form.

RIPENESS OF PEACHES

(Continued from page 55)

sumers. Some of them would never become edible. Forty-five percent of the peaches sorted during the second half were of ripe maturity (most desired by consumers) and 13 percent were too ripe to be readily saleable.

Riper Peaches Cost More to Harvest

Utah growers may be required to pick peaches more often and exercise more care in picking only those peaches that are of the proper stage of maturity in order to deliver more peaches of the most desirable maturity to the consumer.

A peach orchard will need to be picked more times in order to insure the consumer peaches more to her liking. The additional pickings will increase costs and in addition it may be more costly to market ripe fruit because of the greater care needed in handling. As previously indicated the increased yield, larger size, and higher price may more than compensate for this increased cost.

Consumers Will Pay More for Ripe Peaches

During the 1949 season an experiment was conducted in four midwestern markets to determine what, if any, premium consumers would pay for ripe peaches over those peaches which were either firm-ripe or firm. Peaches of the three maturities were displayed side by side in a retail store. In some stores a one cent price per pound differential was established. That is if peaches of the firm maturity were priced at 13 cents a pound, firm-ripe peaches would be priced at 14 cents a pound, and ripe peaches at 15 cents. In some stores a 2 cent per pound differential was established, or prices of 13 cents, 15 cents, and 17 cents on each maturity, and in other stores a 3 cent per pound price differential was established. In all cases an attempt was made to establish the price charged for the peaches of the firm maturity at the prevailing level of prices so that the price charged for the

peaches of firm-ripe and ripe maturity represented true premiums.

Results varied among stores and among markets, but in all cases peaches of firm maturity sold at the slowest rate even though they were the cheapest in terms of cents per pound (table 2). Without exception there were not enough peaches of the ripe maturity to satisfy the demand for peaches of that maturity at the prevailing price even though these peaches were selling at a premium over the price charged for either firm or firm-ripe peaches.

PUBLIC LIBRARIES

(Continued from page 53)

poor areas. As yet federal funds are not available. If and when they are, Utah, as presently situated, cannot participate because of the general backwardness of its library laws and its library planning.

Viewed in the large, the librarians of Utah have insufficient training and receive salaries far below those paid Utah teachers or welfare workers.

Why Has Lag in the Library Field Developed?

If this inquiry could be satisfactorily answered, a considerable mastery of social lag phenomena would be available, not only in this area but in others. Rather than to attempt definite answers, the writer will merely make several general inquiries and a few specific ones to stimulate thought.

Is our organization sufficiently elastic to permit the easy flux and flow of social energy to points needing it or has control of institutions passed too much to entrenched conservative groups and the larger centers of population? Does institutional competition overshadow institutional cooperation so that entrenched institutions constantly seek greater size, wealth, and power at the expense of smaller worthy institutions they are able to overshadow and dwarf?

Are the channels of communica-

tion over loaded with commercial advertising so that information about the realities concerning institutions does not get to the people who so badly need them?

Giving one administrative agency control of two diverse fields may bring about a dwarfing of one of them. Should the State Department of Public Instruction whose interests are concerned largely with the education of children and youth, be required to sustain responsibility also for public libraries which, in addition to serving children, bear the brunt of aiding adults and the aged with information about their problems?

Have we failed in our schools to stimulate the love of knowledge, a continuing interest in books, and in the wisdom of the past which is contained in libraries.

An underlying trend to which most libraries of Utah have not come into good relation is the determining influence of changes in transportation on social institutions. Utah municipal libraries in towns and villages were products of and right for horse drawn vehicles. Today, these community-supported units cannot accumulate the stock of books, and wide range of periodicals, the services, or the financial support which people require in a forward moving culture. Poor organization causes books to grow old in non-use on shelves.

Is the backward state of so many Utah libraries a result in part of allowing natural conditions too much free rein in building inequalities? Natural inequalities can be corrected by planning. Two of Utah's twenty-nine counties have assessed valuation of more than three times as much as all the other counties combined. How easy it is for these counties to maintain libraries with low taxes whereas their country cousins must use much higher tax rates to maintain much poorer libraries. Yet most of the industrial plants in these two counties could not operate without the raw materials furnished them through the labor of people in the backlands where

population is thin and wealth is limited. Salt Lake, Utah, Davis, or Weber Counties can provide for large library expenditures with a mill levy, while rural counties although permitted to levy 2 mills, can have only the semblance of library service. Equalization funds are necessary in Utah if this state is to take adequate care of its library needs. Certainly, in part at least, high and dry institutional areas are the result of lack of sufficient attention by the legislature to the gross inequalities which dominate this state.

NEW PUBLICATIONS

Cir. 135. Growing alfalfa for seed. Departments of Agronomy and Entomology in cooperation with the U.S. Department of Agriculture.

This circular discusses the problems of growing alfalfa seed under three divisions: agronomic practices, control of injurious insects, and pollination. It is a revision of an earlier circular on alfalfa seed production.

Cir. 136. Safflower: its possibilities and culture in Utah, by D. W. Pittman and C. I. Draper. Departments of Agronomy and Poultry Husbandry.

The possibilities of growing safflower to replace some of the winter wheat acreage and on land with limited irrigation water are discussed in this circular. Its value as a feed for livestock is also treated.

Spec. Rep. 10. Facilities for experimental dairy animals, by G. Q. Bateman. Department of Dairy Industry. 12 p.

This report contains the plans for a 32-animal unit, comprising a covered manager, hard surfaced yards, an open shed with a dirt floor, and a feed storage shed. The yard and shed are divided by fence panels and gates into eight units of equal size and are designed to be used by calves 2½ to 3 months of age up to mature cows. Each animal can be tied up for individual feeding. While the plans contain suggestions of value to the general dairy farmer, the unit is primarily for research purposes.

Copies of these publications will be sent on request to the Utah Agricultural Experiment Station, Logan, Utah.

How Can Utah's Libraries Be Improved?

Let us consider some of the more important steps to improve, through legislation, our inadequate libraries. A new library law is needed. It should include provision for state participation in library administration. This would mean either a state library commission with necessary funds, responsible to the governor, and a well-trained director of libraries, or a separate library division of the State Department of Public Instruction, having a well-trained librarian as assistant superintendent with a separate budget for libraries and an advisory board. The present lamentable situation in which there is almost no state participation, represents an acknowledgement of inadequacy.

A few examples may sufficiently clarify this problem. Utah has gone forward with consolidated schools. What would the position of these schools have been had there been no strong State Department of Public Instruction to activate, to unify, to aid the local schools? Or consider the road building program. The large part played by the State Road Commission with its corps of competent engineers is known to all. Utah's small separate libraries cannot become a system without a directive head.

The state must participate in financial support, in order to remove gross inequalities in the ability to support libraries. State equalization funds for schools have long been provided in this and other states. They are no less necessary with libraries.

The new library law should provide for favors to local libraries that join together into an enlarged administrative local system. This inter-library cooperation will not harm the local library, or the local librarian; it will rather multiply the library's effectiveness by making possible the accumulation of large book stocks and periodical collections in the regional areas so that use can be made of modern



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Director

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CONTRIBUTIONS TO RESEARCH

May 15 to August 15, 1955

U.S. Atomic Energy Commission	\$42,500 for study of: sheep losses in the southern Utah range area; minor element deficiency diseases of horticultural crops; virus diseases of stone fruits
National Institutes of Health	\$40,483 for study of the effect of atmospheric fluorides on man
Utah Power and Light Company	\$7,000 } for studies in rural 425 } electrification 290 }
Telluride Power Company	
Southern Utah Power Company	
Utah Idaho Sugar Company	\$2,000 for studies on the influence of fertilizers and irrigation water on the yields of sugar beets
Schaffhausen Corporation	\$2,000 for canal lining studies
U. S. Smelting, Refining & Mining Company	\$1,200 for study of minor element deficiency diseases of horticultural crops
Charles Pfizer & Co., Inc.	\$1,200 to investigate the use of terramycin and DES in the rations of lambs
Weber County	\$1,000 for drainage studies
Utah Cannery Association	\$500 each for research in soil fertility and irrigation as they relate to yield and quality of canning crops
American Can Company	
U.S. Steel Corporation	6 tons of ammonium sulfate for fertilizer studies
Tennessee Valley Authority	2 tons of ammonium nitrate for fertilizer studies
Anaconda Company	2 tons of treble superphosphate for fertilizer studies
Western Phosphates, Inc.	2 tons of treble superphosphate for fertilizer studies
Stauffer Chemical Company	1 ton iron sulfur for alkali soil studies
Geigy Chemical Company	75 pounds of iron chelates for studies of minor element deficiency diseases of horticultural crops
Dow Chemical Company	50 pounds of iron chelates for study of minor element deficiency diseases of horticultural crops
Chemagro Corporation	10 gallons systox for study of the effects of the newer insecticides on animals and man
Agri-Chemical Company	Anhydrous ammonia for dry land wheat fertilizer trials

transportation facilities to make them available to rural and urban people alike. There is no future for our small libraries in isolation by themselves. They cannot grow; they cannot afford trained personnel; they cannot provide good library services.

Perhaps the most important thing rural people have to learn is that they are not helpless in the face of the growing trend toward

In September 1952, the library section of the U. S. Office of Education released information on the status of library planning in the states covering 22 items. Utah was the only state with no plans for all 22 items.

urbanization. Change need not destroy; it need not harm; it can be a means to better things. An enlarged base of operations through inter-community cooperation is the only way rural people can have the modern library facilities that provide the bulk of present day knowledge required by peoples who expect to become an active force in the present generation. This means regional library systems which include several counties, in which, with help from the state adequate resources may be developed to provide trained directive skill at the state and regional headquarters and at the local level more adequate book stocks, periodicals, and other facilities to give quality services to the people.

It is to be remembered that books are the repositories and the vehicles of civilization. Utah must look forward to an early replacement and modernization of antiquated social machinery in the public library field.

Dr. R. H. Walker, director of the Division of Agricultural Science, and Mrs. Walker returned in early August from a trip to Iran. While there Dr. Walker inspected the USAC agricultural program and worked with officials of the United States Operations Mission in Iran and with the Iranian Ministry of Agriculture in developing a continuing program. USAC has a contract with the International Cooperation Administration of the U. S. State Department for the agricultural program in Iran.